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IN THE CLAIMS

The claims, which have not been amended in this response, are presented hereinbelow for the convenience of the Examiner as follows:

1. (Previously presented) An optical signal quality monitoring apparatus comprising:

an optical coupler for performing a coupling operation for an input optical signal;

a photodetector (PD) for converting said input optical signal into an electrical signal;

a clock decision recovery (CDR) unit for detecting a clock from the electrical signal from said PD and recovering data output as a recovered data signal on the basis of the detected clock; and

a monitoring unit for converting an output optical signal from said optical coupler into an electrical signal, amplifying/inverting the electrical signal to a predetermined level, and synthesizing the amplified/inverted signal with a recovered data signal by said CDR unit, band pass filtering the resulting difference signal, and measuring radio-frequency power from the filtered result, said radio-frequency power being an error value of said input optical signal.

2. (Previously presented) An optical signal quality monitoring apparatus comprising:

an optical coupler for performing a coupling operation for an input optical signal;

a photodetector (PD) for converting said input optical signal into an electrical signal;

a clock decision recovery (CDR) unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and

monitoring unit for converting an output optical signal from said optical coupler into an electrical signal, subtracting the converted signal from a recovered data signal by said CDR unit, band pass filtering the resulting difference signal, and measuring radio-frequency power from the filtered result, said radio-frequency power being an error value of said input optical signal;

wherein said monitoring unit includes:

a second PD for receiving an output optical signal from said optical coupler and converting the received optical signal into an electrical signal;

an inverting amplifier for amplifying the electrical signal from said second PD to said predetermined level and inverting the amplified signal;

an adder for adding the amplified/inverted signal from said inverting amplifier to said recovered data signal from said CDR unit to obtain said difference signal;

a band pass filter for performing a band pass filtering operation of passing an output signal from said adder at a predetermined band; and

a radio-frequency power detector for measuring said radio-frequency power from an output signal from said band pass filter.

3. (Original) The apparatus of claim 2, further comprising a processor, communicatively connected to the radio-frequency power detector, having a display screen for notifying a user of said error value.

4. (Original) The apparatus of claim 2, further comprising a processor, communicatively connected to the radio-frequency power detector, having storage for logging said error value.

5. (Original) The apparatus of claim 2, further comprising a processor, communicatively connected to the radio-frequency power detector, configured for determining a source of said error value.

6. (Previously presented) An optical signal quality monitoring apparatus comprising:

a PD for converting an input optical signal into an electrical signal;

a CDR unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and

a monitoring unit including an inverting amplifier for inverting/amplifying the electrical signal from said PD to a predetermined level, and for synthesizing the inverted/amplified signal with a recovered data signal from said CDR unit to obtain a difference signal between said inverted/amplified signal and said recovered data signal, band pass filtering the resulting difference signal and measuring radio-frequency power from the filtered result, said radio-frequency power being an error value of said input optical signal.

7. (Previously presented) An optical signal quality monitoring apparatus comprising:

a PD for converting an input optical signal into an electrical signal;

a CDR unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and

monitoring unit for inverting/amplifying the electrical signal from said PD to a predetermined level, synthesizing the inverted/amplified signal with a recovered data signal from said CDR unit to obtain a difference between said inverted/amplified signal and said recovered data signal, band pass filtering the resulting difference signal and measuring radio-frequency power from the filtered result, said radio-frequency power being an error value of said input optical signal;

wherein said monitoring unit includes:

an inverting amplifier for amplifying the electrical signal from said PD to said predetermined level and inverting the amplified signal;

an adder for adding the amplified/inverted signal from said inverting amplifier to said recovered data signal from said CDR unit to obtain said difference signal;

a band pass filter for performing a band pass filtering operation of passing an output signal from said adder at a predetermined band; and

a radio-frequency power detector for measuring said radio-frequency power from an output signal from said band pass filter.

8. (Original) The apparatus of claim 7, further comprising a processor, communicatively connected to the radio-frequency power detector, having a display screen for notifying a user of said error value.

9. (Original) The apparatus of claim 7, further comprising a processor, communicatively connected to the radio-frequency power detector, having storage for logging said error value.

10. (Original) The apparatus of claim 7, further comprising a processor, communicatively connected to the radio-frequency power detector, configured for determining a source of said error value.

11. (Previously presented) An optical signal quality monitoring apparatus comprising:

an optical coupler for performing a coupling operation for an input optical signal;

a PD for converting said input optical signal into an electrical signal;

a CDR unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and

a monitoring unit for converting an output optical signal from said optical coupler into an electrical signal, said monitoring unit including an inverting amplifier for inverting/amplifying the converted electrical signal to a predetermined level, band pass filtering the inverted/amplified signal and a recovered data signal from said CDR unit, respectively, synthesizing the filtered results to obtain a difference signal between the filtered inverted/amplified signal and the filtered recovered data signal, and measuring radio-frequency power from the resulting difference signal, said radio-frequency power being an error value of said input optical signal.

12. (Previously presented) An optical signal quality monitoring apparatus comprising:

an optical coupler for performing a coupling operation for an input optical signal;

a PD for converting said input optical signal into an electrical signal;

a CDR unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and

monitoring unit for converting an output optical signal from said optical coupler into an electrical signal, inverting/amplifying the converted electrical signal to a predetermined level, band pass filtering the inverted/amplified signal and a recovered data signal from said CDR unit, respectively, synthesizing the filtered results to obtain a difference between the filtered inverted/amplified signal and the filtered recovered data signal, and measuring radio-frequency power from the resulting difference signal, said radio-frequency power being an error value of said input optical signal;

wherein said monitoring unit includes:

a second PD for receiving the output optical signal from said optical coupler and converting the received optical signal into an electrical signal;

an inverting amplifier for amplifying the electrical signal from said second PD to said predetermined level and inverting the amplified signal;

a first band pass filter for performing a band pass filtering operation of passing an output signal from said inverting amplifier at a predetermined band;

a second band pass filter for performing a band pass filtering operation of passing said recovered data signal from said CDR unit at said predetermined band;

an adder for synthesizing output signals from said first and second band pass filters to obtain said difference signal; and

a radio-frequency power detector for measuring said radio-frequency power from an output signal from said adder.

13. (Original) The apparatus of claim 12, further comprising a processor, communicatively connected to the radio-frequency power detector, having a display screen for notifying a user of said error value.

14. (Original) The apparatus of claim 12, further comprising a processor, communicatively connected to the radio-frequency power detector, having storage for logging said error value.

15. (Original) The apparatus of claim 12, further comprising a processor, communicatively connected to the radio-frequency power detector, configured for determining a source of said error value.

16. (Previously presented) An optical signal quality monitoring apparatus comprising:

a PD for converting an input optical signal into an electrical signal;

a CDR unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and

monitoring unit including an inverting amplifier for inverting/amplifying the electrical signal from said PD to a predetermined level, a band pass filter for filtering the inverted/amplified signal and a recovered data signal from said CDR unit, respectively, synthesizing the filtered results to obtain a difference signal between the filtered inverted/amplified signal and the filtered recovered data signal, and measuring radio-frequency power from the resulting difference signal, said radio-frequency power being an error value of said input optical signal.

17. (Previously presented) An optical signal quality monitoring apparatus comprising:

a PD for converting an input optical signal into an electrical signal;

a CDR unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and

monitoring unit for inverting/amplifying the electrical signal from said PD to a predetermined level, band pass filtering the inverted/amplified signal and a recovered data signal from said CDR unit, respectively, synthesizing the filtered results to obtain a difference between the filtered inverted/amplified signal and the filtered recovered data signal, and measuring radio-frequency power from the resulting difference signal, said radio-frequency power being an error value of said input optical signal;

wherein said monitoring unit includes:

an inverting amplifier for amplifying the electrical signal from said PD to said predetermined level and inverting the amplified signal;

a first band pass filter for performing a band pass filtering operation of passing an output signal from said inverting amplifier at a predetermined band;

a second band pass filter for performing a band pass filtering operation of passing said recovered data signal from said CDR unit at said predetermined band;

an adder for synthesizing output signals from said first and second band pass filters to obtain said difference signal; and

a radio-frequency power detector for measuring said radio-frequency power from an output signal from said adder.

18. (Original) The apparatus of claim 17, further comprising a processor, communicatively connected to the radio-frequency power detector, having a display screen for notifying a user of said error value.

19. (Original) The apparatus of claim 17, further comprising a processor, communicatively connected to the radio-frequency power detector, having storage for logging said error value.

20. (Original) The apparatus of claim 17, further comprising a processor, communicatively connected to the radio-frequency power detector, configured for determining a source of said error value.